

SOUTH SASKATCHEWAN RIVER BASIN

WATER MANAGEMENT RECOMMENDATIONS

In response to Phase 2 Terms of Reference



A Report to Alberta Environment

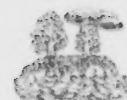
prepared by:

Basin Advisory Committees for the
Oldman River, Red Deer River, Bow River
and South Saskatchewan (sub-basin) River

July 2004

Table of Contents

Context	1
Major Recommendations	2
Detailed Recommendations	5
Water Conservation Objectives	5
Bow River	5
Oldman River	6
Red Deer River	6
South Saskatchewan River	7
Matters and Factors	7
Future Water Management Planning in the SSRB	8
Urgency of Additional Planning and Research	9
Apportionment	10
Long-term flow restoration	11
SSRB Water Allocation Regulation	11
SSRB Water Management Policy	12
Transfers for Irrigation Purposes	12
Basin Advisory Committee Members	13
Glossary	15



Context

At the request of Alberta Environment, four basin advisory committees (BACs) were formed and met regularly to develop recommendations about the future of water management in the South Saskatchewan River Basin (SSRB) in general, and in particular Phase Two of the water management plan. Their primary purpose was to recommend water conservation objectives for each major river downstream of the major dams that would provide a reference point for the future and would describe the best balance between protection of the aquatic environment and consumption of water for economic growth. They also identified other recommendations that should be implemented as part of Phase Two of the water management plan. The BACs considered the current situation, scientific advice about instream flow needs, and scenarios that illustrated predicted future relationships between allocation and instream flows in the rivers. The information contained in this report is submitted to Alberta Environment as advice to guide the development of Phase Two of the water management plan, and to provide a reference for Watershed Planning and Advisory Councils, anticipated to be created in the basin within the next year or two.

The terms of reference for the BACs noted that existing allocations (in good standing) on the rivers were "givens," and the BACs were instructed not to address water quality management, groundwater, the development of new water infrastructure, or the management of the headwaters and upper basins. The BACs were asked to provide advice on water conservation objectives. Future water management planning issues will be addressed subsequently. Alberta Environment informed the BACs that the highest priority was to determine how much water should be left in the rivers for the aquatic environment, and conversely, how much water should be available for consumption.

Most of the SSRB is semi-arid (evaporation exceeds precipitation), and there are significant concerns about the possibility of prolonged drought in this area. Changes in precipitation patterns, along with a loss of glacial water storage in the Rocky Mountains, could decrease future flows during summer months.



Major Recommendations

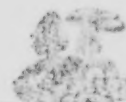
The BACs note that most rivers in the SSRB are at, or already beyond, the highest level of allocation that can be maintained with an expectation that the aquatic ecosystems will be protected. They recognize the aquatic environment has, in some areas, been negatively affected by human use of water and that future allocation will result in increased risk of undesirable changes to the aquatic environment. However, the BACs also recognize that significant changes in allocation of water will increase the risk of water shortfalls for some licence holders and could be detrimental to regional economies. On balance, the BACs believe there is little or no room for continued allocation, except possibly from the Red Deer River. They therefore recommend water conservation objectives (WCOs) and water management guidelines that increase the requirement to maintain water in all rivers for protection of the aquatic environment. In several cases, the increase is very slight because the local BAC believes the current situation is very close to the best balance possible, given a very narrow gap between the requirement to service current allocations and anticipated population growth and the desire to maintain the aquatic environment.

Specific recommendations are itemized in the following report, but a quick summary is provided for the reader's convenience in the following table:

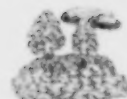
Category	Summary of Recommendations in this Report
Bow River WCOs	<p><i>The BAC described three reaches of the Bow River, recommending a WCO for each:</i></p> <p>Bearspaw Dam outlet to Carseland Weir: Instream flow needs curve (as described by Technical Instream Flow Needs Group)</p> <p>Carseland Weir to Bassano Dam: 80% fish rule curve (no change from current instream objective)</p> <p>Bassano Dam outlet to Grand Forks: Minimum flow of 600 cubic feet per second (17 cubic metres/second)</p> <p><i>The BAC is sending a message that there are limited or no opportunities for future allocation in this river, and that future allocations should result primarily from conservation and allocation transfers within the basin. Future licence holders must accept considerable risk of supply shortfalls. A majority (not consensus) of the BAC favour a moratorium on allocation in the river until studies show whether further allocation is possible. This reflects concern that portions of the river are at risk and future development must be approached in new ways. The BAC feels the aquatic environment must be seen as part of the economy. The BAC does not favour limiting irrigation allocation to the 1991 regulation.</i></p>



Category	Summary of Recommendations in this Report
Oldman River WCO (mainstem)	<p>Maintain the current instream objective (i.e. 80% fish rule curve plus water quality guidelines) as the WCO, but examine the potential to adjust operations of the Oldman dam to increase "flushing flows" in the river and to benefit riparian environments.</p> <p><i>A small majority (not consensus) of the BAC favoured a moratorium on allocation until studies show further allocation is possible. With this WCO, future water allocations will include significant risk of supply shortages. The BAC agreed that irrigation water allocations should be limited by the 1991 regulation.</i></p>
Oldman River WCO (southern tributaries)	<p>The BAC supports continued closure of the tributaries to applications for new allocations.</p> <p><i>While no immediate improvements are possible, the Director should establish long-term restoration water conservation objectives for the Southern Tributaries, which would be met by voluntary actions by licence holders.</i></p>
Red Deer River WCO	<p>Increase the current instream objective to establish a WCO based on 50% of the instream flow needs curve.</p> <p><i>Adopting this WCO would accept some future impact on the aquatic environment in favour of supporting predicted significant growth in the region. The use of this WCO will present risks to junior licence holders (present and future). The BAC notes this WCO would be subject to adjustment as better IFN information becomes available. Irrigation allocations should be limited by the 1991 regulation.</i></p>
South Saskatchewan WCO	<p>Continue the current instream objective (1500 cubic feet per second minimum flow), but add a described flow regime that includes the spring freshet, and variable mid-summer flows.</p> <p><i>The BAC believe the current situation is very close to the best possible balance. There was agreement that future allocation should be closed except for a reserve needed to support some growth in the larger municipal area around Medicine Hat and Redcliff. (Note: potential upstream storage options on the Oldman or Bow would be detrimental to the intended outcome described by this BAC.)</i></p>
Watershed Management	<p>Future water management planning must address each river basin in an integrated fashion that includes: water quality and quantity, surface and groundwater together, and management of the upper basin. This approach requires greater integration of land use planning and water use planning within watersheds and at the municipal level.</p>



Category	Summary of Recommendations in this Report
Apportionment	There should be a committee dedicated to increased coordination of water management among the four sub-basins in the future. This committee should, in particular, address significant concerns from the Red Deer BAC that economic development in that basin will be constrained because allocation in the southern sub-basins will result in a loss of their capability to meet the 50% inter-provincial apportionment requirement in some years, as water use increases.
Long Term Flow Restoration	In several areas of the basin, early studies suggest flow restoration is desirable. The government should adopt a plan to restore river flows in such areas over the long term. This plan should identify measures that will increase the amount of water flowing in the river to support instream flow needs (see page 12 of this report).
Future Water Management Studies and Planning	The BACs strongly support the need for improved studies of the environmental condition of the rivers and the use of these studies in future adjustments to water management. They specifically support the Aquatic and Riparian Condition Assessment currently underway and also support the involvement of Watershed Planning and Advisory Councils in future water management phases. Each BAC identified priority areas for study and management. The Red Deer River BAC notes the need to standardize WCO terminology.



Detailed Recommendations

The following sections of the report describe the "major recommendations" in greater detail, and provide the specific wording of the recommendations as approved by the BACs and their stakeholders.

Water Conservation Objectives

Bow River

The Bow River BAC notes there is essentially "no room left" to divert flows from the river, except under very specific conditions. Already, there are significant concerns that the flow volume of the Bow River cannot effectively maintain water quality. The BAC therefore recommends the following:

UPPER REACH (from Bearspaw to Carseland)

Adopt the IFN requirement as the WCO upon approval of the water management plan. This WCO will only be a condition on licences issued for applications received after approval of the Phase Two water management plan. Reservoir operations will not be changed to meet this WCO.

MIDDLE REACH (between Carseland and Bassano)

Adopt the existing "80% fish rule curve" as the WCO upon approval of the Phase Two water management plan.

LOWER REACH (below Bassano)

Adopt a minimum flow of 600 cubic feet per second as the WCO as a licence condition upon approval of the Phase Two water management plan.

EXISTING JUNIOR LICENCES AND APPLICATIONS

The Director should adopt the existing "80% fish rule curve" instream objective as the WCO on existing junior licences (with WCO condition) and on existing applications-in-process (if and when they are approved). *Although a majority of BAC members prefer the WCO be applied to applications in progress and junior licences, the above approach was essential to gaining consensus on the upper reach WCO.*



MORATORIUM

Given the current situation, a majority (73%) of the BAC feel the government should impose a moratorium on accepting applications for water licences on this river until there is further information that would assure such allocations are reasonable, given the intention to protect the aquatic environment.

Oldman River

The Oldman River BAC recognizes that for the past several years, the Oldman Dam has provided some capacity to support instream flow needs in the Oldman River, but there is little room for future diversion of water, except under specific conditions as stated in the WCO:

MAINSTEM

- a) Adopt the current instream objective (based upon the 80% fish rule curve and water quality requirements), but enhance flows where possible to better provide flushing flows and to meet the needs of riparian areas.
- b) Close the basin to further allocations for irrigation beyond that contemplated by the existing water allocation regulations.

SOUTHERN TRIBUTARIES

The southern tributaries should remain closed to applications for new allocations. The Director should establish long-term restoration WCOs for the southern tributaries, which would be met by voluntary actions by licence holders.

Note: The Terms of Reference for this process clearly state the rights of current allocation holders must be respected.

Red Deer River

The Red Deer BAC notes that although the Red Deer River has fewer allocations than other rivers, accommodating foreseeable demands for allocation will be challenging because of the river's characteristics:

- Volume is small compared to the Oldman or Bow Rivers;
- Volume is dependent on run-off and precipitation in the upper basin (very limited in-flow downstream of the Dickson Dam);



- The Dickson Dam must store water in late summer to compensate for very low winter flow levels in the river (water quality requirement), and
- Lower reaches of the Red Deer River are already below IFN requirements for portions of the year.

These characteristics limit the amount of water available for future allocation. Considering this, the BAC has described a WCO that attempts to balance predicted future allocation requirements with requirements to sustain the aquatic environment. The BAC made their decision after extensive review of the options before them, recognizing that if future studies show the aquatic environment will be at risk, then the Red Deer River cannot be fully allocated.

The BAC recommends the following:

Adopt a flow curve equivalent to 50% of the IFN curve, and continue to operate the Dickson Dam to ensure a minimum flow of 566 cubic feet per second immediately below the dam.

Note: This WCO recommendation is subject to new information about IFN requirements.

South Saskatchewan River

The South Saskatchewan River BAC recommends the following:

High spring flow levels that "flush" the stream bed, and moderate summer flows that are adequate to support fish populations and recreation use, and a minimum flow of 1500 cubic feet per second.

Matters and Factors

In addition to the WCOs, the BACs recognize the new water management plan can require the Director to consider various "matters and factors" in all future water allocation decisions. These matters and factors recommendations are made to cover the full scope of water management, and are not constrained by the specific terms of reference for Phase Two. The BACs jointly recommend that the new water management plan should stipulate that the Director must consider the following:



Matters and Factors	Guidelines
<i>Existing, potential and cumulative effects on the aquatic environment or any applicable WCO</i>	<ul style="list-style-type: none"> No significant adverse effect on the aquatic environment, or No significant adverse effect on achievement of WCOs
<i>Existing, potential and cumulative hydraulic, hydrological and hydrogeological effects</i>	<ul style="list-style-type: none"> No significant adverse effect
<i>Existing, potential and cumulative effects on household users, traditional agriculture users and other licensees</i>	<ul style="list-style-type: none"> "Does not impair the exercise of rights of any household user, traditional agriculture users or other licensee..."
<i>With respect to irrigation, the suitability of the land for irrigated agriculture</i>	<ul style="list-style-type: none"> Class 4 or better in accordance with standards of Alberta Agriculture, Food and Rural Development
<i>Existing, potential and cumulative water quality effects</i>	<ul style="list-style-type: none"> No significant adverse effect on public health and safety or assimilative capacity
<i>Existing, potential and cumulative groundwater effects</i>	<ul style="list-style-type: none"> No significant adverse effect on groundwater quantity or quality
<i>Existing, potential and cumulative effects on the operations of reservoirs or other water infrastructure</i>	<ul style="list-style-type: none"> No significant adverse effect on operations unless the licensee agrees it is practical and feasible to adjust operations to mitigate effects
<i>Amount, timing, quality and location of returned water</i>	<ul style="list-style-type: none"> If the water user returns all withdrawn water to the point of diversion in a condition at least as good as when it was withdrawn and with acceptable timing, a licence should be guaranteed

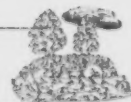
Future Water Management Planning in the SSRB

Based on the "Water for Life" strategy adopted by the Alberta government, the BACs jointly recommend that Watershed Planning and Advisory Councils be created in the SSRB and that future water management planning be designed to incorporate the following guidelines:

Plan, manage and protect the whole watershed (include water quality and quantity—source waters, wetlands, groundwater, riparian areas, buffer strips and land management).

Establish, monitor and report on performance indicators (public information).

Ensure new knowledge is continually incorporated into management of the South Saskatchewan River Basin (SSRB).



Monitor key indicators of environmental health (instream and riparian) and report the observed trends.

Coordinate land use policies with water management (i.e. build water conservation into land use policies such as the Natural Resources Conservation Board guidelines, Forest Management Agreements, the Municipal Government Act and Provincial Land Use Policies). Mandatory, enforceable land use policies.

Integrate economic planning into water management planning

Increase the emphasis on water conservation throughout the SSRB.

Urgency of Additional Planning and Research

The BACs developed a list of studies and planning requirements for future water management planning in the SSRB. They ranked this list in order of urgency, based on their perceptions after two years of review of Phase Two studies. There was significant variance among the rankings from one sub-basin to another. The following table describes the relative urgency of each item, for each sub-basin, based on group rankings:

Additional Projects	Basin Advisory Committee			
	Bow River	Oldman River	Red Deer River	S. Sask. River
Protection of all water resources in the basin (source lakes, aquifers, wetlands, etc.)	3	2	2	2
Water quality: study and guidelines	5	3	1	1
Integrating watershed management in the basin (one single water management plan that addresses the entire watershed rather than portions of it)	4	1	3	3
Integrating groundwater and surface water management	2	5	4	6
Integrating land use planning with watershed management*	1	4	5	5
Connecting planning priorities in the basin to "Water for Life" priorities	7	6	7	4
Explore the potential for increased water storage capacity, including wetlands, to benefit aquatic and riparian habitats	6	7	6	7
Research groundwater sources and movement in the basin	-	8	8	8

*Bow River BAC felt one agency should be accountable.

It is expected that all sub-basins will be fairly represented in one or more Watershed Planning and Advisory Councils (WPACs) which will likely be formed in most of the sub-basins, and those councils will consider the above list (for each basin affected by that watershed).

All BACs strongly supported the current initiative (by Alberta Environment) to complete an Aquatic and Riparian Areas Condition Assessment. This study will provide mapping of the river reaches so changes can be monitored in the future. All BACs support the development of a long-term plan to restore aquatic and riparian environments where necessary. The Oldman BAC noted that portions of the Southern Tributaries in their basin are highly impacted and are obvious candidates for restoration, but there is limited opportunity to improve this situation in the short term.

Apportionment

Future water management planning should place more emphasis on coordination of water management among the basins. Because the Red Deer River basin is the least allocated, the Red Deer BAC noted a concern that future economic development in that basin would be jeopardized because increased water use in the southern sub-basins will require the Red Deer River to contribute more than 50% of its flow to apportionment in some years. It was agreed this was not a desirable outcome. The BACs jointly recommend that apportionment decisions should be made in a manner that is fair and practical, and therefore recommend the following measures be implemented:

1. *Establish criteria to guide apportionment decisions, agreeable to all future Watershed Planning and Advisory Councils (WPAC) and representatives of the South Saskatchewan River sub-basin, if no WPAC is formed, and let managers in Alberta Environment make the best decisions, based on these criteria.*
2. *Create a Committee of WPAC representatives (including representation from the South Saskatchewan River sub-basin, if there is no WPAC) to provide advice to Alberta Environment on decisions that must be made on an operational basis to meet apportionment. (This Committee could be called on for advice, at least annually. As noted above, this Committee could also address other water management integration requirements among the sub-basins.)*

Red Deer BAC members do not want the Red Deer River contributing more than 50% to apportionment, unless exceptional conditions (like extended drought) require all SSRB basins to make adjustments.



Long-term flow restoration

The BACs jointly recommend the provincial government facilitate a shared effort to achieve long-term flow restoration. The water management plan should identify river reaches where flow restoration is a priority and identify measures that will be employed over the long term to achieve restoration where it is deemed necessary. The following approaches are recommended:

Apply conservation holdbacks (10% unless otherwise justified) to all water allocation transfers whenever the aquatic environment could benefit from increased flows. *Note: Several BACs expressed concern that holdbacks on temporary transfers could be an undesirable barrier to such transfers.*

Identify potentially beneficial changes in the management of dams and diversions (implement if allocation holders agree it is practical and feasible to adjust operations to mitigate effects).

Explore the potential for increased water storage capacity (including wetland conservation and restoration) to benefit aquatic and riparian habitats.

Cancel licences not in good standing (in order to remove the licence seniority from the priority listing) and re-allocate subject to the WCO.

Provide incentives for using less water.

Allow water transfers to be used only for instream flow needs (i.e. this could support a "water trust" or WCO licences)

SSRB Water Allocation Regulation

The SSRB Water Allocation Regulation was implemented in 1991 to establish reasonable limits on irrigation within the overall basin. It was established to set a limit on the amount of water to be allocated to irrigation. Since that time, the new Water and Irrigation Districts Acts have been enacted. The BACs indicated whether additional water should be allocated to irrigation in the future, or if the limits suggested by the 1991 Regulation should be continued:

- Bow – the WCOs will guide future water allocation. The regulation should be rescinded as soon as the WCOs are implemented.
- Oldman – 1991 regulation limits should continue to apply.
- Red Deer – 1991 regulation limits should continue to apply.
- South Saskatchewan – 1991 regulations should continue to apply.



SSRB Water Management Policy

The SSRB Water Management Policy was a consolidated statement of the policies guiding water allocation in the basin. Since that time, the Water Act, the Water for Life strategy and other policies have been announced, and have developed a new policy base. The BACs were asked whether or not there is any need to continue the earlier policy after the Water Management Plan is implemented.

Response from the BACs:

- Bow – The water management policy statements cannot yet be set aside. Further discussion will be needed after the water management plan is finalized.
- Oldman – Water management policies can be set aside once the water management plan is finalized.
- Red Deer – The water management policy statements cannot yet be set aside. Further discussion will be needed after the water management plan is finalized.
- South Saskatchewan - Water management policies can be set aside once the water management plan is finalized.

Transfers for Irrigation Purposes

All four BACs identified whether water transfers for the purposes of irrigation should be allowed in the SSRB, even if those transfers would increase the amount of water beyond the limits indicated in the 1991 recommendation. Responses of the BACs are noted below:

- Bow – There should be no limitation on transfers for the purposes of irrigation. Transfers should operate according to the market.
- Oldman – A majority of the BAC felt transfers should be limited by the 1991 regulation limits. However, two members were concerned this limitation interferes with the market mechanism that is the basis for water transfers.
- Red Deer – The BAC was split in its response. 67% agreed there should be no limitations on transfers for the purposes of irrigation. 33% felt water should not be transferred for irrigation purposes if the total allocation would exceed the 1991 limits.
- South Saskatchewan – Transfers to irrigation should be limited by the 1991 regulation limits.



Basin Advisory Committee Members

Sincere thanks to the Basin Advisory Committee members who attended many meetings and reviewed many reports and studies over the past four years in an effort to provide the best possible advice to the Alberta Government about future water management in the SSRB.

Name	Sector	Specific Affiliation
BOW RIVER BAC		
Steve Meadows, Chair	General Public	
Lori Brewer-Lawe	General Public	
Gloria Wilkinson	General Public	
Bert van Duin	Industry	Westhoff Engineering Resources Inc.
Gord MacMahon	Industry	APF Energy / Trees Alive Alberta
Chantelle Cardinal	First Nations	First Nations Technical Services Advisory Group
Annette Lonechild	First Nations	Stoney First Nation
Cedric Solway	First Nations	Siksika First Nation
Norm Carlson	Health Authorities	Calgary Health Region
Roger Drury	Water Power	TransAlta Utilities Corporation
Paul Fesko	Urban Municipal	City of Calgary
Melanie Cook	Urban Municipal	City of Calgary
Yin Deong	Urban Municipal	City of Calgary
Judy Stewart	Urban Municipal	Town of Cochrane
Neil Hollands	Urban Municipal	Town of Brooks
Hugh Pepper	Rural Municipal	M.D. of Bighorn No. 8
Vince Fabian	Rural Municipal	County of Newell No. 4
Dr. Derald Smith	Academia	University of Calgary
Gary Kindrat	Ecosystem Protection	Ducks Unlimited
Chris Manderson	Ecosystem Protection	City of Calgary
Heinz Unger, Vice-chair	Ecosystem Protection	Alberta Wilderness Association
Bonnie Kleinmark	Ecosystem Protection	River Valley Committee, Parks Calgary Foundation
Mona Keffer	Fisheries	Alberta Wilderness Association
Richard Phillips, Vice-chair	Irrigation	Bow River Irrigation District
Jim Webber	Irrigation	Western Irrigation District
Earl Wilson	Irrigation	Eastern Irrigation District
Chris Vermeeren	Ranching/Stock Watering	County of Newell No. 4
Robert Everett	Recreation	Sarcee Fish & Game Association
Sheena Majewski	Observer	Dept. of Fisheries and Oceans Canada
Mark Bennett	BRBC Liaison	Bow River Basin Council
Mike Murray	BRBC Liaison	Bow River Basin Council

Name	Sector	Specific Affiliation
OLDMAN RIVER BAC		
Duncan Lloyd, Chair	Urban Municipal	Town of Coaldale
Barbara Lacey, Vice-chair	Urban Municipal	City of Lethbridge
Doug Kaupp	Urban Municipal	City of Lethbridge
Garth Bekkering	Urban Municipal	Town of Taber
Ralph Bourque, Vice-chair	Urban Municipal	Town of Pincher Creek
Brian Hammond	Rural Municipal	M.D. of Pincher Creek
Hank Van Beers	Rural Municipal	M.D. of Taber
Cecil Wiest	Rural Municipal	M.D. of Taber
Greg Nikles	Industry	Rogers Sugar Ltd.
Ron Renwick	Irrigation	St. Mary River Irrigation District
Kevin Haggart	Irrigation	Lethbridge Northern Irrigation District
Larry Nolan	Agriculture (other water users)	
Jim Clarke	Recreation	Lethbridge Fish & Game Association (affiliated with Alberta Fish & Game Association)
Cheryl Bradley	Ecosystem Protection	Southern Alberta Environmental Group
Cheryl Fujikawa	Ecosystem Protection	Southern Alberta Environmental Group
Gary Kindrat	Ecosystem Protection	Ducks Unlimited
Henry Bosman		Oldman Dam Environmental Advisory Committee
Andrew Hurly		Oldman Dam Environmental Advisory Committee
Vacant	First Nations	
RED DEER RIVER BAC		
Al Kennedy, Chair	Industry	Nova Chemicals
Gordon Musgrove	Rural Municipal	County of Newell No. 4
Dug Major	Rural Municipal	Special Areas
Art Grenville	Rural Municipal	Starland County
Ian Harvie	Rural Municipal	Mountain View County
Allison Williams	Rural Municipal	Mountain View County
Ken Van Dewark	Rural Municipal	Red Deer County
John Van Doesburg	Rural Municipal	Mountain View County
Douglas Fleming	Municipal	Palliser Regional Municipal Services
Bill Shaw	Urban Municipal	Represented 23 towns, villages and the City of Red Deer
Myrna Bauman	Urban Municipal	Town of Three Hills
Greg Conn	Agriculture	Alberta Beef Producers
Jack Swainson	Agriculture	Alberta Conservation Tillage Society
Colin Kure	Upstream Recreation	Alberta Fish and Game Association
Jill Dyck	Downstream Recreation	Alberta Fish and Game Association
Margaret Coutts, Vice-chair	Ecosystem Protection	Red Deer River Naturalists
Tracy Scott	Ecosystem Protection	Ducks Unlimited
Todd McBride	Tourism	



Name	Sector	Specific Affiliation
SOUTH SASKATCHEWAN RIVER SUB-BASIN BAC		
Frank Wetsch, Chair	Urban Municipal	City of Medicine Hat
Grayson Mauch, Vice-chair	Urban Municipal	City of Medicine Hat
Floyd Haas	Rural Municipal and Agriculture (other water users)	Cypress County
Ron Wendling	Industry	Canadian Fertilizers Ltd.
Jim French	Industry	Canadian Fertilizers Ltd.
Corlaine Gardner	Environmental	Grassland Naturalists
Duncan Baldie	Recreation	Medicine Hat Fish & Game Association
Ralph Pinder	Recreation	Redcliff Anglers
Gary Bierback	Irrigation	St. Mary River Irrigation District

Glossary

Apportionment

Master Agreement on Apportionment - The 1969 Master Agreement on Apportionment for the SSRB between Alberta and Saskatchewan allows Alberta to "divert, store or consume" from the river system each year, a volume of water equal to one-half of the apportionable flow (see explanation below) of the South Saskatchewan River at the Alberta-Saskatchewan boundary (including the Red Deer River). The remaining volume of flow must be allowed to pass downstream into Saskatchewan. The exception to this general rule is that Alberta is entitled to divert, store or consume a minimum of 2.1 million acre feet in any year. The effect of this exception is that during years when the volume of natural flow is less than 4.2 million acre feet (a rare occurrence), Alberta may pass less than one-half of the apportionable flow to Saskatchewan. If at any time during a year Alberta wants to divert, store or consume more than half the apportionable flow, a flow rate of 1,500 cubic feet per second (cfs) must be maintained at the Saskatchewan border, unless the natural flow is less than 3,000 cfs, in which case half the natural flow must be passed.

"Apportionable flow" is less than the total natural flow from the SSRB because part of the SSRB flow originates in the U.S.A. and is diverted for use in the U.S.A. These diverted flows are excluded from the calculation of the flows that Alberta must pass to Saskatchewan.



Aquatic environment (from the Water Act)

"Aquatic environment" means the components of the earth related to, living in or located in or on water or the beds or shores of a water body, including but not limited to:

- (i) all organic and inorganic matter, and*
- (ii) living organisms and their habitat, including fish habitat,*

and their interacting natural systems.

Conservation holdback (from the Water Act: section 83(1))

If the Director is of the opinion that withholding water is in the public interest to protect the aquatic environment or to implement a water conservation objective, and the ability to withhold water has been authorized in an applicable approved water management plan or order of the Lieutenant Governor in Council, the Director may withhold up to 10 per cent of an allocation of water under a licence that is being transferred.

The withholding occurs at the time the new licence created for the transferred allocation is issued (section 82(2) of the Water Act). That is, at the location of the original diversion, the allocation ceases to be diverted, and at the location of the new diversion, the allocation that can be diverted is 90 per cent (or more) of the original allocation.

"Condition on licences"

Most water allocation licences have on them a number of conditions. A common one is a restriction that water can only be withdrawn if river flows are greater than a certain rate.

Fish rule curve

A variable flow recommendation used until the mid-1990s as the method for defining instream flow needs for fish. The "80% fish rule curve" (see definition below) is in use as the instream objective for parts of the Bow and Oldman Rivers (and in the case of the latter, a water quality component is added). The fish rule curve was determined using flow versus habitat relationships. The recommended flow varies with the seasonal hydrological conditions. Due to limitations in habitat measurement techniques at higher flows, the fish rule curve did not address requirements in the medium to high flow range. The fish rule curve approach does



not provide for full ecosystem protection and is no longer used in Alberta for determining instream flow needs. The Fish Rule Curve only applies from April 1 to October 31, nominally the open water period. In the Bow River the Tessmann method defines the instream objective during the rest of the year. In this method a flow recommendation is calculated based on a percentage of mean annual flow. In the Oldman River a minimum flow for water quality is maintained during the winter.

The 80% Fish Rule Curve was an arbitrary 20% reduction of the Fish Rule Curve flows made to permit additional water extraction from the Bow and Oldman Rivers. The reduction was not based on biological criteria.

Flushing flows

Artificial or natural river flows that are of sufficient magnitude and duration to scour and remove fine sediments and aquatic vegetation from the stream bottom so it is suitable for fish spawning and decaying vegetation is removed that can reduce oxygen levels.

Freshet

The flow of water resulting from heavy rain or snow melt.

Instream flow needs (IFN) curve

The quantities of water and water quality conditions and the flow regimes needed to sustain riverine processes and associated ecosystems over the long term.

Instream objective

This term is presently in common use and refers to instream flows targeted by operators of storage via storage releases or as a restriction on licence holders. Instream objectives are in place in parts of all SSRB rivers although some offer limited protection of the aquatic environment. This term is expected to fall out of use once water conservation objectives are established. There are instream objectives in the Bow and Oldman Rivers that are variable flows, while others are single-value, steady-state flows.

Junior licences

- In the Red Deer River basin, a licence issued after the Dickson Dam was licensed in 1977.
- In the Bow River basin, a licence issued since 1992, when the fish rule curve instream objective started to be applied as a licence condition.
- In the Oldman River basin, a licence issued after the Oldman Dam was licensed in 1988.
- In the southern tributaries of the Oldman River, a licence issued after 1950, when the Waterton-St. Mary Headworks were licensed.

Licence in good standing

- Not under suspension.
- Not being considered for cancellation.
- Not subject to an investigation, water management order or an enforcement order.
- No outstanding complaint that may result in compliance or enforcement action.
- Not subject to a prosecution, administrative penalty, civil matter or EAB appeal.
- In compliance with the terms and conditions of the licence.

Riparian vegetation

Vegetation dependent on excess moisture during a portion of the growing season on a site that is definitely moister than the surrounding area. Usually associated with the banks and shores of water bodies.

Water allocation transfer

A water allocation transfer occurs after the holder of an existing licence in good standing for the withdrawal of water agrees to provide all or part of the allocation to another person or organization following which an application is made to the Director and the transfer is approved by the Director. With a transfer, the allocation is separated from the original land and a new licence with the seniority of the transferred allocation is issued and attached to the new location. The Director can place conditions on the new licence created as a result of the transfer.



Water conservation objective (WCO) (from the Water Act)

"Water conservation objective" means the amount and quality of water established by the Director under Part 2, based on information available to the Director, to be necessary for the

- (i) protection of a natural water body or its aquatic environment, or any part of them,*
- (ii) protection of tourism, recreational, transportation or waste assimilation uses of water, or*
- (iii) management of fish or wildlife,*

and may include water necessary for the rate of flow of water or water level requirements.

A licence can be issued by the Director to the Government of Alberta for the purpose of implementing a water conservation objective.



